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(54) Title: MODIFIED WHOLE CELL, CELL EXTRACT AND OMV-BASED VACCINES

(57) Abstract: Live vaccines, live-attenuated vaccines, dead vaccines, protein preparations for use in vaccines and OMVs for use in vaccines are free of *CEACAM1*-binding Opa, though may contain Opa variants that are antigenic but don't bind to *CEACAM1*.